

Introduction: Why This Program Matters

What Is the Extent of “the Waste Problem”?

Decisions made five decades ago to pursue a nuclear weapons program and to develop nuclear energy for civilian use committed the Nation to perpetual custody of a large and growing inventory of radioactive materials. Spent nuclear fuel from commercial nuclear power plants constitutes the largest portion of the inventory. The balance consists of nuclear materials managed by the U.S. Department of Energy (DOE). Primarily resulting from atomic energy defense activities, these materials include spent nuclear fuel from weapons production, domestic research reactors, and foreign research reactors; high-level radioactive waste from reprocessing spent nuclear fuel; surplus weapons-usable plutonium waste forms; and naval spent nuclear fuel. The potential risks these materials pose demand continuous, responsible long-term management.

With the Nuclear Waste Policy Act of 1982, the Federal Government created the Office of Civilian Radioactive Waste Management (OCRWM) to develop a permanent, safe, geologic repository for disposal of these materials. The Act gave the Nuclear Regulatory Commission (NRC), which was already regulating commercial nuclear power reactors, the authority to decide whether to authorize construction and operation of the repository. The early history of OCRWM’s Program was dominated by concern for disposal of commercial spent nuclear fuel—*closing the fuel cycle*, in the words of the nuclear industry. In recent years, recognition has grown that disposal of DOE-managed nuclear materials is also important.

The Program Profile in Appendix B provides basic information on OCRWM’s Program. Appendix C provides detailed information on materials destined for geologic disposal.

Why Is This Program Important?

The Administration continues to believe that permanent geologic disposal should remain the basic goal of this Nation’s high-level radioactive waste management policy.

- The longer surplus weapons-usable plutonium remains above ground, the greater the risk that terrorists or a rogue nation will divert and use some of it to fabricate nuclear devices that, even if crudely made, could cause catastrophic damage. The U.S. commitment to immobilize plutonium and permanently isolate it from the accessible environment clearly signals our larger commitment to the nuclear nonproliferation that we want to promote worldwide.
- Internationally, permanent geologic disposal is the consensus position on management of commercial spent nuclear fuel. Our Nation’s commitment to this position is the technical foundation for our international policy on nuclear nonproliferation. That policy assumes that fuel originating in the U.S. and used in foreign research reactors will be disposed of in the U.S. repository, and it undergirds our advocacy of limiting international trade in weapons-usable nuclear materials.
- A geologic repository is on the critical path for the accelerated environmental cleanup

of numerous DOE sites around the country. That cleanup serves not only an environmental, but a fiscal goal: reduction of the huge mortgage costs that are the legacy of the Cold War.

- The Navy needs to dispose of its spent naval reactor fuel to ensure the continued operation of its nuclear-powered fleet. That fuel is currently stored in Idaho, along with some DOE spent nuclear fuel. Under a consent agreement among the Navy, DOE, and the State, all spent nuclear fuel must be removed from Idaho by 2035.
- Orderly operation of the nuclear reactors that supply 20 percent of the Nation's electricity rests on NRC licensing, which in turn relies on a waste-confidence decision review that the NRC conducts every 10 years to assess the prospects for timely disposal of commercial spent nuclear fuel. Without progress toward a repository, continued reactor operations and license renewals could be jeopardized. The next review should occur in 1999.
- If economic conditions accelerate the shutdown of commercial nuclear power reactors, the utilities that own them will have to continue maintaining custody of their spent nuclear fuel until the Federal Government can accept it.

What Have We Achieved to Date?

The "waste problem" presents a unique and daunting set of challenges: (1) the complexities of managing a large project in a Federal setting subject to multiple regulatory, planning, and reporting requirements, stringent oversight, changes in congressional direction, and fluctuations in funding; (2) the challenges of operating on a scientific frontier; (3) the need to

integrate an unusually broad array of scientific, technical, and managerial disciplines; (4) the demands of a complex and lengthy licensing proceeding; and (5) the political sensitivities associated with an inherently controversial mission.

Over the past 16 years, many Congresses, several Administrations, regulatory and oversight bodies, stakeholders, OCRWM staff and contractors, and DOE's National Laboratories have worked steadily toward the goal of geologic disposal. Some of the significant achievements to date follow:

- Landmark legislation, the Nuclear Waste Policy Act of 1982. It codified the commitment of the Federal Government to solve "the waste problem," created a financial mechanism to pay for the solution, and defined an orderly, open process to develop a waste management system.
- A potential repository site at Yucca Mountain, Nevada, and a comprehensive viability assessment that details what has been learned from 15 years of site characterization.
- An extensive and advanced underground laboratory at the site that provides direct access to the geologic formations within which a repository would be housed.
- An increasingly sophisticated body of scientific, engineering, and performance assessment expertise. With that expertise we are able to (1) design site investigations that yield needed data, (2) use the data to design facilities that are tailored to the site and consistent with NRC licensing requirements, and (3) develop models simulating the performance of the repository under a range of site conditions over thousands of years.

- The regulatory expertise to conduct a complex licensing proceeding that could take at least 3 years and entail thousands of supporting documents. Years of consultation between OCRWM and the NRC have helped us align our approaches to difficult technical matters.
- A program plan and the program infrastructure needed to integrate the work of scientists, engineers, performance assessment modelers, and regulatory experts.
- The expertise and plans that will be needed to create a nationwide system to safely transport radioactive waste.

- Long-standing and productive working relationships among OCRWM and oversight bodies, the larger technical and scientific communities, and a host of stakeholders. These relationships are the bedrock of efforts to earn public acceptance.

A measure of the U.S. achievement is the fact that other nations continue to look to our Program as a model for their own efforts. The discussion of international cooperation in Chapter One underscores the importance of the U.S. contribution to resolution of this problem.

This page intentionally left blank.